



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I**  
2100 RENAISSANCE BOULEVARD, SUITE 100  
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

November 18, 2013

Mr. Thomas P. Joyce  
President and Chief Nuclear Officer  
PSEG Nuclear LLC - N09  
P.O. Box 236  
Hancocks Bridge, NJ 08038

**SUBJECT: HOPE CREEK GENERATING STATION UNIT 1 – NRC INTEGRATED  
INSPECTION REPORT 05000354/2013004**

Dear Mr. Joyce:

On September 30, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Hope Creek Generating Station (HCGS). The enclosed inspection report documents the inspection results, which were discussed on October 10, 2013, with Mr. P. Davison, Site Vice President of Hope Creek, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents two self-revealing findings of very low safety significance (Green). Additionally, one licensee-identified violation which was determined to be of very low safety significance is listed in this report. The findings are determined to involve violations of NRC requirements. However, because of their very low safety significance, and because they are entered into your corrective action program (CAP), the NRC is treating these findings as NCVs, consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at HCGS. In addition, if you disagree with the cross-cutting aspect assigned any of the findings in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at Hope Creek Generating Station.

In accordance with 10 *Code of Federal Regulations* (CFR) 2.390 of the NRCs "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

***/RA/***

Glenn T. Dentel, Chief  
Reactor Projects Branch 3  
Division of Reactor Projects

Docket No: 50-354  
License No: NPF-57

Enclosure: Inspection Report 05000354/2013004  
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

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Glenn T. Dentel, Chief  
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**U.S. NUCLEAR REGULATORY COMMISSION**

REGION I

Docket No: 50-354

License No: NPF-57

Report No: 05000354/2013004

Licensee: Public Service Enterprise Group (PSEG) Nuclear LLC

Facility: Hope Creek Generating Station

Location: P.O. Box 236  
Hancocks Bridge, NJ 08038

Dates: July 1, 2013 through September 30, 2013

Inspectors: F. Ramírez, Acting Senior Resident Inspector  
D. Dodson, Acting Senior Resident Inspector  
S. Ibarrola, Resident Inspector  
J. Furia, Senior Health Physicist  
E. Burket, Emergency Preparedness Inspector  
J. Laughlin, Emergency Preparedness Inspector  
R. Nimitz, Senior Health Physicist

Approved By: Glenn T. Dentel, Chief  
Reactor Projects Branch 3  
Division of Reactor Projects

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## SUMMARY

IR 05000354/2013004; 07/01/2013 - 09/30/2013; Hope Creek Generating Station; Post-Maintenance Testing and Follow-up of Events and Notices of Enforcement Discretion.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. The inspectors identified two self-revealing Green non-cited violations (NCVs). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP), dated June 2, 2011. All violations of Nuclear Regulatory Commission (NRC) requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated July 9, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4.

### Cornerstone: Barrier Integrity

- Green. A self-revealing finding of very low safety significance (Green) and associated NCV of Title 10 of the *Code of Federal Regulation* (10 CFR) Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," was identified for PSEG's failure to properly test the 'B' Filtration, Recirculation and Ventilation System (FRVS) recirculation fan following maintenance in accordance with site procedures. Specifically, on June 3, 2013, PSEG did not perform the required post-maintenance test (PMT) prior to returning the system to service. Consequently, when the fan failed during its surveillance on June 24, 2013, there was no reasonable assurance that the fan was operable since the last time maintenance was performed on it. Corrective actions included adding this event to the Licensed Operator Requalification training program to improve knowledge regarding PMT requirements.

The performance deficiency (PD) was determined to be more than minor because it is associated with the system, structure, or component (SSC) and Barrier Performance attribute of the Barrier Integrity cornerstone, and affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Using IMC 0609, Appendix A, "The SDP for Findings At-Power," dated June 19, 2012, the finding was determined to be of very low safety significance (Green) because it only represented a degradation of the radiological barrier function provided for the standby gas treatment system. This finding had a cross-cutting aspect in the area of Human Performance, Decision-Making, because PSEG's decisions did not demonstrate that nuclear safety was the overriding priority. Specifically, PSEG did not use conservative assumptions in decision-making when determining the proper PMT for the 'B' FRVS recirculation fan prior to returning it to service. [H.1(b)]. (Section 1R19)

- Green. A self-revealing finding of very low safety-significance (Green) and associated NCV of Technical Specifications (TS) 3.4.3.2, "Reactor Coolant System (RCS) Operational Leakage," was identified on June 12, 2013, when a through-wall flaw was discovered in the RCS pressure boundary. Specifically, because Hope Creek failed to perform maintenance on a 'B' residual heat removal (RHR) shutdown cooling (SDC) vent line in accordance with PSEG maintenance procedures, the plant operated with RCS pressure boundary leakage for a period of time prohibited by TS. Immediate corrective actions included vent line

assembly replacement and examination of additional vent line assemblies installed on RHR piping in the drywell under the same design change. Planned corrective actions include visual examination of other components that had work involving cutting on small bore piping in the drywell.

The PD is more than minor because it is associated with the RCS Equipment and Barrier Performance attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, RCS, and containment) protect the public from radionuclide releases caused by accidents or events. PSEG's failure to perform maintenance in accordance with station procedures resulted in plant operation with a condition prohibited by TS and the degradation of a principal safety barrier. The inspectors determined that the finding is of very low safety significance (Green) because the piping flaw, after a reasonable assessment of degradation, could not result in exceeding the RCS leak rate for a small loss of coolant accident (LOCA) and could not likely affect other systems used to mitigate a LOCA resulting in a total loss of their function. This finding had a cross-cutting aspect in the Human Performance area, Work Practices component, because PSEG did not ensure supervisory and management oversight of work activities, including contractors, such that nuclear safety is ensured. Specifically, management did not appropriately supervise workers to ensure work was performed in accordance with site maintenance procedures. Even though the PD could have occurred any time between November 2007 and May 2012, the inspectors determined that the performance characteristic associated with ineffective work activity oversight could not be conclusively placed in the earlier portion of that time window. In addition, PSEG had not previously implemented actions to specifically correct or eliminate the potential for this PD. As a result, the inspectors concluded that the PD is indicative of current performance [H.4(c)]. (Section 4OA3)

### **Other Findings**

One violation of very low safety significance that was identified by PSEG was reviewed by the inspectors. Corrective actions taken or planned by PSEG have been entered into PSEG's CAP. This violation and corrective action tracking number are listed in Section 4OA7 of this report.

## REPORT DETAILS

### Summary of Plant Status

Hope Creek began the inspection period at full rated thermal power. On August 1, 2013, the 'B' circulating water pump (CWP) tripped. Both reactor recirculation pumps (RRP) experienced an automatic intermediate runback, lowering reactor power to 70 percent. The unit was returned to full power on August 3, 2013. On September 19, 2013, during a planned power reduction to support a control rod sequence exchange, the 'A' RRP unexpectedly lowered to minimum speed. Operators reduced power to less than 60.86 percent in accordance with TS requirements for single loop operations. The unit was returned to 100 percent power following corrective maintenance on September 21, 2013, and remained at or near full power for the duration of the inspection period, except for brief periods to support planned testing and rod pattern adjustments.

### 1. REACTOR SAFETY

#### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

#### 1R01 Adverse Weather Protection (71111.01 – 1 sample)

##### External Flooding

##### a. Inspection Scope

During September 2013, the inspectors performed an inspection of the external flood protection measures for Hope Creek. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), Chapters 2.4.2, "Floods," and 3.4, "Water Level (Flood) Design," which described the design flood levels and protection areas containing safety-related equipment to identify areas that may be affected by flooding. The inspectors also reviewed the limiting conditions for operations and the surveillance requirements in TS 3.7.3, "Flood Protection." The inspectors' review focused on the Hope Creek Unit 2 areas, which protect Unit 1 equipment, that are susceptible to external flooding. Specifically, the inspectors walked down the north and west walls of the reactor building (RB) 102', 77', and 54' elevations. The inspectors inspected the condition of the walls and ensured that any outside penetrations susceptible to external flooding were flood protected. The inspectors also inspected the flood doors present in that area, which are listed in TS Table 3.7.3-1, "Perimeter Flood Doors." The inspectors verified that the doors were in conformance with plant maintenance procedures and drawings. Additionally, the inspectors reviewed the abnormal operating procedure, HC.OP-AB.MISC-0001, "Acts of Nature," for mitigating external flooding during severe weather to determine if PSEG had planned and established adequate measures to protect against external flooding events. Documents reviewed for each section of this inspection report are listed in the Attachment.

##### b. Findings

No findings were identified.



## 1R04 Equipment Alignment

### .1 Partial System Walkdowns (71111.04 – 4 samples)

#### a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- 'B' core spray (CS) loop during planned maintenance on the 'A' CS loop and 'C' emergency diesel generator (EDG) on July 11, 2013
- 'C' EDG following planned maintenance on September 5, 2013
- High pressure coolant injection (HPCI) during reactor core isolation cooling (RCIC) testing on September 12, 2013
- RCIC on September 25, 2013

The inspectors selected these systems based on their risk-significance relative to the Reactor Safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, TSs, work orders (WOs), condition reports (notifications), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether PSEG staff had properly identified equipment issues and entered them into the CAP for resolution with the appropriate significance characterization.

#### b. Findings

No findings were identified.

### .2 Complete Walkdowns (71111.04S – 1 sample)

#### a. Inspection Scope

On August 6-15, 2013, the inspectors performed a complete system walkdown of accessible portions of the 'A' safety auxiliaries cooling system (SACS) loop to verify the equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment lineup procedures, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hangar and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether PSEG staff had properly identified equipment issues and entered them into their CAP for resolution with the appropriate significance characterization.

Additionally, the inspectors reviewed a sample of related condition reports and WOs to ensure PSEG appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

Resident Inspector Quarterly Walkdowns (71111.05Q - 5 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that PSEG controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out-of-service, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- FRH-II-432, 'B' SACS heat exchanger (HX) and pump room, elevation 102' on July 26, 2013
- FRH-II-433, 'A' SACS HX and pump room, elevation 102' on July 26, 2013
- FRH-II-511, diesel fuel oil storage tanks area, elevation 54' on August 15, 2013
- FRH-II-413, HPCI pump and turbine room, elevation 54' on September 4, 2013
- FRH-II-435, control rod drive hydraulic control units areas, elevation 102' on September 24, 2013

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to assess susceptibilities involving internal flooding. The inspectors also reviewed the CAP to determine if PSEG identified and corrected flooding problems and whether operator actions for coping with flooding were adequate. The inspectors focused on the service water intake structure to verify the adequacy of common drain lines and sumps, sump pumps, level alarms, and control circuits.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance  
(71111.11Q – 2 samples)

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on July 23, 2013, which included the loss of a 120 volt alternating current (AC) inverter, a dual RRP seal failure, the loss of main condenser vacuum, and a RCIC steam leak. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the TS action statements entered by the shift. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

The inspectors observed power ascension activities on August 1, 2013, following an emergent downpower due to the 'B' CWP trip. The inspectors observed reactivity control briefings to verify that the briefings met the criteria specified in OP-AA-101-111-1004, "Operations Standards," and HU-AA-1211, "Pre-Job Briefings." Additionally, the inspectors observed licensed operator performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 2 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on SSC performance and reliability. The inspectors reviewed CAP documents (notifications), maintenance WOs (orders), and maintenance rule (MR) basis documents to ensure that PSEG was identifying and properly evaluating performance problems within the scope of the MR. For each sample selected, the inspectors verified that the SSC was properly scoped into the MR in accordance with

10 CFR 50.65, and verified that the (a)(2) performance criteria established by PSEG staff were reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that PSEG staff was identifying and addressing common cause failures that occurred within and across MR system boundaries.

- 'C' traveling water screen did not start during 'C' station service water pump start on February 1, 2013 (Order 70148443)
- 'B' CWP trip on August 1, 2013 (Notification 20616716)

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that PSEG performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the Reactor Safety cornerstones. As applicable for each activity, the inspectors verified that PSEG personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When PSEG performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Planned maintenance on the 'A' CS loop and 'C' EDG on July 10, 2013 (Orders 60110728 and 60086990)
- Emergent maintenance following the 'B' CWP trip on August 1, 2013 (Order 60112242)
- Planned maintenance on the cooling tower blowdown and SACS radiation monitors on August 26, 2013 (Orders 60109625 and 60109629)
- Planned maintenance on the 'B' EDG on September 9, 2013 (Order 30189510)
- Emergent maintenance following failure of the 'A' RRP speed controller on September 19, 2013 (Order 60112918)

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 3 samples)a. Inspection Scope

The inspectors reviewed operability determinations (ODs) for the following degraded or non-conforming conditions:

- Chilled water temperature control valves not in-service tested (Order 70154357)
- 'B' EDG fuse module failure (Order 70155551)
- Reactor water clean-up non-regenerative HX high temperature isolation failed surveillance (Notification 20621408)

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the ODs to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and UFSAR to PSEG's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by PSEG. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)Temporary Modificationsa. Inspection Scope

The inspectors reviewed the temporary modification listed below to determine whether the modification affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and conducted field walkdowns of the modification to verify that the temporary modification did not degrade the design bases, licensing bases, and performance capability of the affected systems.

- Temporary configuration change package 4HT-13-008 – Recirculation Pump Seal Purge Temp Cooling

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 samples)a. Inspection Scope

The inspectors reviewed the PMTs for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

- 'A' reactor pressure vessel narrow range level indicator emergent repairs following erratic indication on June 19, 2013 (Orders 60111709 and 60111956)
- 'B' FRVS recirculation fan emergent flow controller repairs following failure on June 24, 2013 (Order 70155511)
- 'B' FRVS recirculation fan planned maintenance on August 14, 2013 (Order 30219029)
- 'B' RB to torus vacuum breaker relief valve replacement on August 22, 2013 (Order 50086351)
- 'D' EDG planned maintenance on August 19, 2013 (Orders 60112101 and 60096119)
- 'B' RHR pump planned system maintenance on September 11, 2013 (Order 30195631)

b. Findings

Introduction. A self-revealing finding of very low safety significance (Green) and associated NCV of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for PSEG's failure to test the 'B' FRVS recirculation fan following maintenance in accordance with site procedures. Specifically, PSEG did not perform the required PMT prior to returning the system to service.

Description. On June 24, 2013, Hope Creek operations personnel were in the process of testing the 'B' FRVS recirculation fan in accordance with surveillance procedure HC.OP-ST.GU-0005, "FRVS Fan Operability Test." The FRVS maintains a slight vacuum in the Reactor Building while circulating and cleaning-up the atmosphere within the building during abnormal (accident) conditions. The purpose of HC.OP-ST.GU-0005 is to demonstrate the operability of a single FRVS recirculation fan. When the fan started, it tripped immediately on a low flow actuation signal. When instrument technicians performed an inspection of the fan's control system, they discovered that a pin in the connector for the flow-indicating controller was not locked in place. As a result of the loose connection, the flow-indicating controller did not receive a signal and could not operate the fan damper. This in turn caused the 'B' FRVS fan to trip on low flow.

The 'B' FRVS recirculation fan had successfully completed its monthly surveillance test on June 2, 2013. However, the flow-indicating controller connector was replaced the

next day when the flow controller indication was discovered pegged high. Following the repairs on June 3, 2013, instrument technicians performed a bench calibration of the controller unit. In addition, once the controller was reinstalled, a functional test of it was completed. The functional test included the verification of signal continuity through the flow-indicating controller. However, it did not involve a functional test of the recirculation fan itself to ensure that the controller could actually control the recirculation fan (which would have been accomplished by starting the recirculation fan). The operations personnel credited this continuity verification as the PMT of the 'B' FRVS recirculation fan, and proceeded to restore the fan to operable status and returned it to service.

As a result of the June 24, 2013, failed surveillance, PSEG chartered an apparent cause evaluation (ACE). The ACE determined that the functional test that was credited as the PMT on June 3, 2013, did not fully meet the requirements of MA-AA-716-012, "Post-Maintenance Testing." Specifically, MA-AA-716-012, Step 4.2.5.1 states, that "after restoration of lifting leads during maintenance, then a functional test of the associated component or instrument shall be performed when practical." In this case, the associated component was the 'B' FRVS recirculation fan and as a result, placing the fan in service would have been the correct PMT. Consequently, when the fan failed during its surveillance on June 24, 2013, there was no reasonable assurance that the fan was operable since the last time maintenance was performed on it.

Analysis. The inspectors determined that the failure to perform an appropriate PMT of the 'B' FRVS recirculation fan prior to returning it to service in accordance procedure MA-AA-716-012, "Post-Maintenance Testing," was a PD that was within Hope Creek's ability to foresee and correct, and should have been prevented. Using the guidance in IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, the inspectors determined that the PD is greater than minor, and therefore a finding, because it is associated with the SSC and Barrier Performance attribute of the Barrier Integrity cornerstone, and affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, RCS, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, because the 'B' FRVS recirculation fan was returned to service without a proper PMT on June 3, 2013, it impacted fan reliability and there was no reasonable assurance of fan operability. Subsequently, on June 24, 2013, the fan failed to start when called upon for testing. Using IMC 0609, Appendix A, "The SDP for Findings At-Power," dated June 19, 2012, the finding was determined to have very low safety significance because it only represented a degradation of the radiological barrier function provided for the standby gas treatment system. This finding had a cross-cutting aspect in the area of Human Performance, Decision-Making, because PSEG's decisions did not demonstrate that nuclear safety was the overriding priority. Specifically, PSEG did not use conservative assumptions in decision-making when determining the proper PMT for the 'B' FRVS recirculation fan prior to returning it to service. [H.1(b)]

Enforcement. 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. PSEG established MA-AA-716-012, "Post-Maintenance Testing," as guidance to ensure that equipment will perform its intended function when returned to service from maintenance. MA-AA-716-012 states in part, that "after restoration of lifting leads during maintenance, then a functional test of the associated

component or instrument shall be performed when practical.” Contrary to this requirement, on June 3, 2013, PSEG returned the ‘B’ FRVS recirculation fan to operable status without a functional test of the component. As a result, when the fan failed on June 24, 2013, there was no reasonable assurance that the fan was operable since the last time maintenance was performed. Corrective actions included adding this event to the License Operator Requalification training program to improve the knowledge regarding PMT requirements. Since this issue was entered into PSEG’s CAP as Notification 20613407, this violation of 10 CFR Part 50, Appendix B, Criterion V, is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000354/2013004-01, Failure to Follow Post-Maintenance Testing Procedure Prior to Returning the ‘B’ FRVS Recirculation Fan to Service)**

1R22 Surveillance Testing (71111.22 – 3 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TSs, the UFSAR, and PSEG procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations, range, and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- HC.OP-ST.KJ-0004(Q), EDG 1DG400 Operability Test Monthly on July 22, 2013
- HC.OP-IS.GJ-0102, ‘B’ Control and Diesel Area Temperature Control Valves Inservice Test, on August 14, 2013 and HC.OP-IS.GJ-0101, ‘A’ Control and Diesel Area Temperature Control Valves Inservice Test, on August 27, 2013 (IST)
- HC.OP-IS.BD-0001(Q), RCIC Pump – OP203 – Inservice Test, on September 12, 2013

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The Office of Nuclear Security and Incident Response headquarters staff performed an in-office review of the latest revisions of various Emergency Plan Implementing Procedures and the Emergency Plan located under ADAMS accession number ML130520717.

PSEG determined that in accordance with 10 CFR 50.54(q), the changes made in the revisions resulted in no reduction in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR



Part 50. The NRC review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection.

b. Findings

No findings were identified.

**2. RADIATION SAFETY**

**Cornerstone: Occupational and Public Radiation Safety (OS, PS)**

2RS05 Radiation Monitoring Instrumentation (71122.05)

This area was inspected during the week of August 12, 2013. The inspector reviewed the radiation instrument monitoring program to verify that PSEG was ensuring the accuracy and operability of radiation monitoring instruments. The inspectors used the requirements in 10 CFR Part 20, Hope Creek TSs and procedures as criteria for determining compliance.

a. Inspection Scope

Inspection Planning

The inspectors reviewed the plant UFSAR and station procedures to identify radiation monitoring instruments.

Whole Body Counter

The inspectors reviewed the methods and sources used to calibrate the whole body counter and reviewed calibration reports.

b. Findings

No findings were identified.

2RS07 Radiological Environmental Monitoring Program (REMP) (71124.07 -1 sample)

This area was inspected during the week of August 12, 2013, to verify that the REMP appropriately quantifies the impact of radioactive effluent releases to the environment and sufficiently validates the integrity of the radioactive gaseous and liquid effluent release program. The inspectors used the requirements in 10 CFR Part 20; 40 CFR Part 190; 10 CFR 50 Appendix I, and the site's TSs, Offsite Dose Calculation Manual (ODCM), and station program procedures to determine compliance.

a. Inspection Scope

Inspection Planning

The inspectors reviewed the annual radiological environmental and effluent operating reports (2011, 2012) to verify that the REMP was implemented in accordance with the

TS and ODCM. The inspectors reviewed the ODCM to identify environmental monitoring and sampling locations stations.

#### Site Inspection

The inspectors reviewed the following program aspects:

- Land Use Census and the positioning of monitoring stations
- PSEG meteorological data
- Scope and results of the PSEG's ground water monitoring program
- Scope and results of the PSEG's inter-laboratory comparison program

#### Identification and Resolution of Problems

The inspectors determined if problems associated with the REMP were being identified by the PSEG at an appropriate threshold and were properly addressed for resolution in the CAP.

b. Findings

No findings were identified.

#### 4. OTHER ACTIVITIES

##### 4OA1 Performance Indicator Verification (71151 – 5 samples)

###### Mitigating Systems Performance Index (MSPI)

###### a. Inspection Scope

The inspectors reviewed PSEG submittal of the MSPI for the following systems for the period of September 1, 2012 through June 30, 2013:

- Emergency AC Power System (MS06)
- High Pressure Injection System (MS07)
- Heat Removal System (MS08)
- RHR System (MS09)
- Cooling Water Support System (MS10)

To determine the accuracy of the performance indicator (PI) data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment PI Guideline," Revision 6. The inspectors also reviewed PSEG's operator narrative logs, CAP records, MSPI reports, key PI summary records, operating data reports the MSPI basis document, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

###### b. Findings

No findings were identified.

##### 4OA2 Problem Identification and Resolution (71152)

###### .1 Routine Review of Problem Identification and Resolution Activities

###### a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that PSEG entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended condition report screening meetings.

###### b. Findings

No findings were identified.

.2 Occupational and Public Radiation Safety (71124.05, 71124.07)

a. Inspection Scope

The inspector reviewed corrective action documents to determine if identified problems were entered into the CAP for resolution. The review was against the criteria contained in 10 CFR 20, TSs, the ODCM, and station procedures.

b. Findings

No findings were identified.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 1 sample)

.1 (Closed) Licensee Event Report (LER) 05000354/2013-003-01: Through-wall Flaw Discovered on RHR Shutdown Cooling Return Vent Line

a. Inspection Scope

On June 13, 2013, following a scram that occurred on June 12, 2013, PSEG identified leakage from the 'B' RHR SDC return vent line. The source of the leak was identified as a through-wall flaw at the pipe/weld interface upstream of the outboard isolation valve (BC-V597), which is inside the RCS pressure boundary. The estimated leakage rate from the through-wall flaw was less than one gallon per minute.

This condition is reportable under 10 CFR 50.73(a)(2)(ii)(A) for a condition that resulted in a principal safety barrier being seriously degraded. This leak existed during plant operation. Since Hope Creek TSs limit RCS pressure boundary leakage to zero, this condition is also reportable under 10 CFR 50.73(a)(2)(i)(B) for a condition prohibited by TSs. The inspectors performed an in-depth review of this LER and PSEG's ACE associated with notification 20614723.

b. Findings

Introduction. A self-revealing finding of very low safety-significance (Green) and associated NCV of TS 3.4.3.2, "RCS Operational Leakage," was identified on June 12, 2013, when a through-wall flaw was discovered in the RCS pressure boundary. The plant operated with RCS pressure boundary leakage for a period of time prohibited by TSs due to PSEG's failure to perform maintenance on a 'B' RHR SDC vent line in accordance with its maintenance procedures.

Description. Hope Creek Operations personnel identified indications of a possible RCS leak in June 2012 due to an increasing trend of the drywell floor drain flow, which also measures the RCS unidentified leak rate. On June 12, 2013, operators manually scrammed the reactor due to degrading condenser vacuum following a trip of the 'B' CWP. On June 13, 2013, during initial walk down of the drywell following the scram, a through-wall flaw was identified on the vent line for the 'B' RHR SDC return header. The flaw was located in between BC-V589 and BC-V597, two 1-inch manual isolation valves that constitute the vent line assembly. The flaw was specifically found at the toe of the

weld on the upstream side of valve BC-V597. The vent line assembly, which is American Society of Mechanical Engineers Class 1 piping, is located downstream of the shutdown cooling return check valve, within the reactor coolant pressure boundary.

PSEG shipped the section of the vent line containing the flaw to an independent laboratory for failure analysis. The failure analysis concluded that the through-wall flaw was caused by mechanical degradation such as grinding. This conclusion was based on the symmetry of the opening on the pipe inner diameter surface, outer diameter-to-inner diameter flowed metal on the pipe inner diameter surface, and surface cold working on the flaw's side walls. There was no evidence that the defect region was caused by in-service degradation such as flow erosion, pitting corrosion, corrosion fatigue, or mechanical fatigue. PSEG determined the cause of the flaw was a human performance deficiency during the completion of work in the drywell. Since the toe of the weld was ground through-wall with a tool, PSEG concluded that a person working in the drywell caused the hole. MA-AA-1000, "Maintenance Standards and Practices," states in part, that "all work on plant SSCs will be performed using appropriate documentation such as work orders, notifications, or applicable troubleshooting process control forms." PSEG could not identify specific work orders where this weld was included as part of a work package.

The ACE for this issue revealed that BC-V589 and BC-V597 vent line isolation valves were manipulated for system restoration during maintenance in June 2005 and in April 2006. No issues were documented with the vent line during those evolutions. The evaluation also revealed that the expanded 10-year in-service system leakage test of the reactor coolant pressure boundary was completed on November 5, 2007. During this in-service leakage test, the upstream isolation valve, BC-V589, was opened, and the vessel was pressurized to test integrity of piping to the outboard isolation valve, BC-V597. The leakage test in November 2007 would have shown a leak had the through-wall flaw in the pipe been present at that time. The test was completed with satisfactory results and no leakage from this area was identified. The 2007 in-service leakage test was the last time that the BC-V589 and BC-V597 valves were manipulated. An increased unidentified RCS leakage rate was identified in June 2012, following start up from the unit's last refueling outage. The upstream isolation valve, BC-V589, degraded such that leakage past the valve seat and out of the through-wall flaw was captured in the drywell floor drain flow.

Analysis. The inspectors determined that Hope Creek's failure to perform maintenance in accordance with site procedures was a PD that was within their ability to foresee and correct, and should have been prevented. Specifically, work was performed in the 'B' RHR SDC vent line, however, no specific WOs were identified where the weld containing the through-wall flaw was included as part of a work package. Using the guidance in IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, the inspectors determined that the finding is more than minor because it is associated with the RCS Equipment and Barrier Performance attribute of the Barrier Integrity cornerstone and adversely affected its objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. PSEG's failure to perform maintenance in accordance with station procedures resulted in plant operation with a condition prohibited by TSs and the degradation of a principal safety barrier.

In accordance with IMC 0609, Attachment 4, "Initial Characterization of Findings," dated June 19, 2012, RCS boundary issues, such as leaks, will be considered under the Initiating Events cornerstone. The inspectors evaluated the finding using Exhibit 1 of IMC 0609, Appendix A, "The SDP for Findings At-Power," dated, June 19, 2012, and determined the finding is of very low safety significance (Green) because the piping flaw, after a reasonable assessment of degradation, could not result in exceeding the RCS leak rate for a small LOCA, and could not likely affect other systems used to mitigate a LOCA, resulting in a total loss of their function.

The inspectors determined that the finding had a cross-cutting aspect in the Human Performance area, Work Practices component, because PSEG did not ensure supervisory and management oversight of work activities, including contractors, such that nuclear safety is ensured. Specifically, management did not appropriately supervise workers to ensure work was performed in accordance with site maintenance procedures and as a result, Hope Creek operated in a condition prohibited by TSs. Even though the PD could have occurred any time between November 2007 and May 2012, the inspectors determined that the performance characteristic associated with ineffective work activity oversight could not be conclusively placed in the earlier portion of that time window. In addition, PSEG had not previously implemented actions to specifically correct or eliminate the potential for this PD. As a result, the inspectors concluded that the PD is indicative of current performance [H.4(c)].

Enforcement. TS 3.4.3.2, "RCS Operational Leakage," states, in part, that RCS leakage shall be limited to no pressure boundary leakage. Contrary to the above, from approximately June 2012 until June 12, 2013, Hope Creek operated in power operation with RCS pressure boundary leakage. Specifically, Hope Creek failed to perform maintenance in accordance with site maintenance procedures, which resulted in a through-wall flaw on the vent line for the 'B' RHR SDC return header. This flaw, in turn, resulted in pressure boundary leakage and Hope Creek's operation in a condition prohibited by TS. Immediate corrective actions included vent line assembly replacement and examination of additional vent line assemblies installed on RHR piping in the drywell under the same design change. Planned corrective actions include visual examination of other components that had work involving cutting on small bore piping in the drywell. Because this violation was of very low safety significance (Green) and was entered into PSEG's CAP as Notification 20614723, the issue is being treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy. **(NCV-05000354/2013004-02, Failure to Perform Maintenance in Accordance with Station Procedures Led to RCS Pressure Boundary Leakage)**

#### 4OA6 Meetings, Including Exit

On October 10, 2013, the inspectors presented the inspection results to Mr. P. Davison, Site Vice President of Hope Creek, and other members of the Hope Creek staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

#### 4OA7 Licensee-Identified Violation

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements, which meet the criteria of the NRC Enforcement Policy for being dispositioned as a NCV.

- On August 27, 2013, a radiation protection technician transported four sources of radioactive material to an area of the owner controlled property for use in a maintenance activity. At the end of shift, the technician brought the sources offsite on the public highways, rather than returning them to the protected area, without the knowledge of radiation protection management. Once radiation protection management became aware that the sources were offsite, the technician was contacted and promptly returned the sources to Hope Creek.

10 CFR 71.5, and 49 CFR Parts 172 and 173 require that such sources be properly shipped when on public highways. Contrary to these requirements, these sources were transported on public highways without the required specification packaging, marking, labeling, and shipping papers. This finding was evaluated using IMC 0609, Appendix D for public radiation safety. The finding involved radioactive material control in the area of transportation, but did not involve exceeding a radiation limit, package breach, certificate of compliance, burial ground nonconformance, or failure to make a required notification; therefore, the finding is Green. This issue was documented in PSEG's CAP as Notification 20619627.

**ATTACHMENT: SUPPLEMENTARY INFORMATION**

**SUPPLEMENTARY INFORMATION****KEY POINTS OF CONTACT**Licensee Personnel

P. Davison, Site Vice President  
 E. Carr, Plant Manager  
 Y. Ghotok, System Engineer  
 P. Mattiace, I&C Maintenance Technician  
 T. Morin, Regulatory Assurance  
 M. Reed, Manager, Nuclear Shift Operations  
 M. Reeser, System Engineer  
 W. Schmidt, I&C Maintenance Supervisor  
 S. Simpson, Manager, Regulatory Assurance

**LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED**Opened/Closed

05000354/2013004-01	NCV	Failure to Follow PMT Procedure Prior to Returning the 'B' FRVS Recirculation Fan to Service (Section 1R19)
05000354/2013004-02	NCV	Failure to Perform Maintenance in Accordance with Station Procedures Led to RCS Pressure Boundary Leakage (Section 4OA3)

Closed

05000354/2013-003-01	LER	Through-wall Flaw Discovered on RHR Shutdown Cooling Return Vent Line (Section 4OA3)
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**LIST OF DOCUMENTS REVIEWED****Section 1R01: Adverse Weather Protection**Procedures

OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidelines, Revision 7

Notifications

20613802, HC Flood Walkdown Report not clear  
 20619702, Door seals will not inflate



Drawings

A-0203-0, General Plant Floor Plan Level 3 – Elevation 102', Revision 19

**Section 1R04: Equipment Alignment**

Procedures

HC.OP-SO.BJ-0001, HPCI System Operation, Revision 48

HC.OP-SO.EG-0001(Q), Safety and Turbine Auxiliaries Cooling Water System Operation, Revision 52

HC.OP-SO.KJ-0001, EDGs, Revision 66

HC.OP-ST.BD-0001, RCIC System Piping and Flow Path Verification – Monthly, Revision 14

HC.OP-ST.BE-0004, 'B' CS Loop System Piping and Flow Path Verification – Monthly, Revision 4

HC.OP-ST.BJ-0001, HPCI System Piping and Flow Path Verification – Monthly, Revision 18

HC.OP-ST.EG-0001(Q), SACS Flow Path Verification – Monthly, Revision 9

HC-PRA-005.0017, SACS System Notebook, Revision 3

OP-AA-108-116, Protected Equipment Program, Revision 7

Drawings

M-11-1, Sheet 1, SAC RB, Revision 31

M-11-1, Sheet 2, SAC RB, Revision 42

M-11-1, Sheet 3, SAC RB, Revision 28

M-12-1, Sheet 1, SAC Auxiliary Building, Revision 31

M-12-1, Sheet 2, SAC RB, Revision 14

M-30-1, Sheet 1, Diesel Engine Auxiliary Systems Fuel Oil, Revision 26

M-30-1, Sheet 2, Diesel Engine Auxiliary Systems Intercooler and Injector Cooling, Jacket Water, Crankcase Vacuum Air Intake, Exhaust, and Vibration Monitoring Systems, Revision 21

M-30-1, Sheet 3, Diesel Engine Auxiliary Systems Starting Air & Lube Oil, Revision 21

M-49-1, Sheet 1, RCIC, Revision 30

M-50-1, Sheet 1, RCIC Pump Turbine, Revision 29

M-52-1, Sheet 1, CS, Revision 31

M-55-1, Sheet 1, HPCI, Revision 40

M-56-1, Sheet 1, HPCI Pump Turbine, Revision 32

Orders

50157517, ST 3M OP-IS.EG-101 SACS Subsystem A Valves

50157704, ST 3M HC.OP-IS.EG-0003 C-SACS Pump IST

50158122, ST 3M OP-IS.EG-0001 A-SACS PMP I/S Test

50159486, 1M ST OP-ST.EG-0001 SACS Flowpath

50159565, 1M ST OP-ST.BJ-001(Q) HPCI Piping and Flow

50160456, 1M ST OP-ST.BD-0001 RCIC Piping Flowpath

50160331, 1M ST OP-ST.BJ-001(Q) HPCI Piping and Flow

60109055, EG-HV-2398E Overhaul Actuator

Other Documents

Protected Equipment Log for 'B' CS Loop, dated July 7, 2013

SACS System Health Report, Q2-2013

**Section 1R05: Fire Protection**

Procedures

FRH-II-413, Hope Creek Pre-Fire Plan, HPCI Pump & Turbine Room, RHR Pump & HX rooms, Elevation: 54'-0", Revision 3  
FRH-II-432, Hope Creek Pre-Fire Plan, 'B' SACS HX & Pump Room, Elevation 102'-0", Revision 3  
FRH-II-433, Hope Creek Pre-Fire Plan, 'A' SACS HX & Pump Room, Elevation 102'-0", Revision 4  
FRH-II-435, Hope Creek Pre-Fire Plan, Steam Tunnel, RCIC, HPCI, Pipe Chases, CRD Removal & Repair Area, Elevation 102'-0", Revision 4  
FRH-II-511, Hope Creek Pre-Fire Plan, Diesel Fuel Oil Storage Tanks Area, Elevation 54'-0", Revision 6

Notifications (\*NRC identified)

20622215\*, Issues Identified 102' RX Building

Drawings

M-5068, RB Fire & Smoke Detector Locations Plan at Elevation 102'-0" Area 7, Revision 6

**Section 1R06: Flood Protection Measures**

Procedures

ER-AA-1001, Component Classification, Revision 1  
HC.OP-AR.ZZ-0001, Overhead Annunciator Window Box A1, Revision 21,  
OP-HC-108-115-1001, Operability Assessment and Equipment Control Program, Revision 26

Notifications (\*NRC identified)

20596306, D SSWIS Sump Pump Visibly Vibrating  
20596309, C SSW Bay Sump Pump Bearings Worn  
20596500, CP577 Running Uncoupled  
20596586, High High Sump Level Alarm Not Received  
20600968, B/D SSW Pump Room Sumps Hi Alarm  
20601649, Hi Hi Level Sump Alarm Not Received  
20601650, Both C/D Sump Pumps Failed To Operate  
20606497, Both C/D Sump Pumps Failed To Operate  
20608751, D SW Abandoned Still Water Pipe Leak  
20611655, Sump Hi Level Alarm in A/C SW Bay  
20615678, BP577 Sump Pump Intermittent Failure  
20619820, Sump Pump Failed  
20620001, SWIS Unsat  
20620366, C/D 577 Pump Hi Level Locked In  
20621449, B-P-577 Discharge Pipe Leak at Flange  
20621451, LFV-015 Check Valve Leaking By  
20621900, Sump Pump Motor Shaking/Pump Noise

Drawings

A-0549-0, Sheet 1, Separation Criteria SW Intake Structure – Sections, Revision 0  
A-0549-0, Sheet 2, Separation Criteria SW Intake Structure – Sections, Revision 0  
FSK-P-1-LF-601, Small Pipe/Intake Structure Sump Pumps 1EP577 & 1FP577 Discharge to Debris Trough, Revision 3

FSK-P-1-LF-602, Small Pipe/Intake Structure Sump Pumps 1AP577 & 1BP577 Discharge to Debris Trough, Revision 3  
FSK-P-1-LF-603, Small Pipe/Intake Structure Sump Pumps 1GP577 & 1HP577 Discharge to Debris Trough, Revision 3  
FSK-P-1-LF-604, Small Pipe/Intake Structure Sump Pumps 1CP577 & 1DP577 Discharge to Debris Trough, Revision 4  
FSK-P-1-LF-606, Small Pipe/Intake Structure Sump Pumps 1AP577, 1BP577, 1EP577 & 1FP577 Discharge to Debris Trough, Revision 3  
M-97-0, Sheet 5, Building and Equipment Drains Intake Structure, Revision 7

Orders

30238795, 12M PM 1C/D-P-577 CS Piping Inspection  
80101842, System Engineering Component Classification

Other Documents

HC-PRA-012, Internal Flood Evaluation Summary and Notebook, Revision 2  
HC-PRA-017, Internal Flood Walkdown Notebook, Revision 0

Calculations

Calculation Number 24-0024, Flood Levels: Intake Structure, Revision 3

**Section 1R11: Licensed Operator Regualification Program and Licensed Operator Performance**

Procedures

OP-AA-101-111-1004, Operations Standards, Revision 4  
HU-AA-1211, Pre-Job Briefings, Revision 11

Other Documents

SG-703, Loss of DD482/Dual RR Seal Failure/Loss of MC Vacuum/RCIC Steam Leak, Revision 0

**Section 1R12: Maintenance Effectiveness**

Procedures

ER-AA-310, Implementation of the MR, Revision 11  
ER-AA-310, Implementation of the MR, Revision 12  
ER-AA-310-1003, MR - Performance Criteria Selection, Revision 6  
ER-AA-310-1004, MR – Performance Monitoring, Revision 10  
ER-HC-310-1009, MR System Function and Risk Significant Guide, Revision 9  
HC.OP-IS.EA-0101, SW Subsystem A Valves - Inservice Test, Revision 53  
HC.OP-SO.EA-0001, SW System Operation, Revision 39  
MA-AA-716-012, PMT, Revision 18

Notifications (\*NRC identified)

20572853, EA-HV-2198C Disch Valve Dual Indication  
20590969, EA-HV-2198C Disch Valve Dual Indication  
20593600, EA-HV-2198C Dual Indication  
20594208, EA-HV-2198C Dual Indication  
20597608, H1EA -EA-HV-2198C did not open fully

20612199, EA-HV-2198C Malfunction  
20613291, EA-HV-2198C Malfunction  
20616716, 'B' Circ Water Pump Trip  
20617416, EA-HV-2198C Dual Indication on Pump Stop  
20617782, 1EAHV-2198C Rebuild Recommended  
20617870, 1EAHV-2198C Operator Rebuild  
20618937, SW Pump IST Testing Issues  
20621694, MR Plant Level Monitoring Issue  
20620753\*, Revise FFCDE 70149159-0120 for HV-2198C  
20621773\*, Incorrect 'B' CW Trip MR FF Review

#### Drawings

E-0211-0, Sheet 5, Electrical Schematic Diagram Station SW System, Revision 7  
J-10-0, Sheet 16, Logic Diagram Station SW System, Revision 10  
M-10-1, Sheet 1, SW, Revision 54  
M-10-1, Sheet 2, SW, Revision 42

#### Orders

60108302, RP- 1EAHV-2198C -Dual Indication Test/Setup  
60111379, EA-HV-2198C Malfunction  
70149159, EA-HV-2198C Dual Indication  
70156989, EA-HV-2198C Dual Indication on Pump Stop  
80108793, H1EA -EA-HV-2198C #C# SSW Discharge Valve

#### Other Documents

10855-D3.9, Design, Installation and Test Specification for SW System, Revision 11

### **Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

#### Procedures

EP-AA-121, Emergency Response Facilities and Equipment Readiness, Revision 0  
HC.IC-DC.ZZ-0071, Bailey Manual Unit Type 722, Style 1 and Style 2, Revision 8  
HC.OP-AB.RPV-0001, Reactor Power, Revision 13  
HC.OP-AB.RPV-0003, Recirculation System/Power Oscillations, Revision 27  
HC.OP-IO.ZZ-0006, Power Changes During Operation, Revision 57  
HC.OP-SO.DA-0001(Z), CW System Operation, Revision 60  
LS-AA-104-1000, 50.59 Resource Manual, Revision 7  
OP-AA-101-112-1002, On-Line Risk Assessment, Revision 7  
OP-AA-102-104, Pertinent Information Program for the 'B' Circ Pump Trip, Revision 1  
OP-AA-106-101-1006, Issue Resolution Documentation Form for 'B' CW Pump H1DA-1B-P-501, Revision 7  
OP-AA-108-116, Protected Equipment Program, Revision 7  
MA-AA-716-004, Conduct of Troubleshooting, Revision 12  
WC-AA-10, Work Management Process Description, Revision 2  
WC-AA-101, On-Line Work Management Process, Revision 21  
WC-AA-105, Work Activity Risk Management, Revision 2

#### Notifications

20614578\*, NRC Identified Scaffold Clearance A Core  
20614579\*, NRC Identified Protected Equipment  
20616716, 'B' CW Pump Trip

20616995, Troubleshooting Activities for the 'B' CW Pump Trip  
20617171, Recorder on 'B' CW Pump Breaker  
20617384, During Functional Testing and Troubleshooting the Breaker Located in 52-50204  
Would Not Close  
20618167, Perform Metallic Whisker Inspection  
20618518, CTB RMS LCO Comm Critique  
20618962, Components Rusted Thru at CTB and Bld 23  
20619357\*, Risk Assessment Questions RMS  
20619467, Light on HOSP-0SPRI-8817 RM23A Flashing  
20619623, Detector Not Responding to Cal Sources  
20619624, Cooling Tower Blowdown Sample Pump Fail  
20619716, Detector Not Responding to Cal Sources  
20619871\*, EP Equipment Comp Actions  
20620784\*, Prot Equip Discrepancies – NRC Identified  
20621894, Send Pushbutton out for Analysis  
20622038, 1BBHC-R621A1B31 Failure AB Entry  
20622042, SWS/Spray Wash Pumps Vib Hi Alarm

#### Drawings

M-09-1, Sheet 1, Circulating Water, Revision 46  
M-09-1, Sheet 2, Circulating Water, Revision 27  
M-61-1, Sheet 1, Liquid Radwaste Collection, Revision 26  
M-63-0, Sheet 1, Liquid Radwaste Floor Drain Processing, Revision 27  
M-63-0, Sheet 2, Liquid Radwaste Floor Drain Processing, Revision 14

#### Orders

30189510, 1B-G-400 OOS Relay Maintenance  
60109625, DCP 80107149: 0SPRE-4859A: Replace Rad Mon  
60109629, DCP 80107149: 0SPRE-8817: Replace Rad Mon  
60110728, Louder than Normal Noise #7 Cyl C-EDG  
60112918, Recirc Controller Failure Abnormal Entry

#### Other Documents

HCGS PRA Risk Evaluation Form for August 25, 2013, through August 31, 2013  
HCGS PRA Risk Evaluation Form for July 7, 2013, through July 13, 2013  
HCGS PRA Risk Evaluation Form for September 8, 2013, through September 14, 2013  
HCGS PRA Risk Evaluation Form for September 15, 2013, through September 21, 2013,  
Revision 2  
Protected Equipment Log – B-EDG C/T, September 9, 2013  
Protected Equipment Log – B Recirc Pump, September 20, 2013  
Protected Equipment Log – HPCI, July 10, 2013  
Shift Training Notebook, 'B' CW Pump Discharge Valve Status and Pump Monitoring, 8/5/2013  
TS Action Statement Log Number 13-220, CTB Rad Monitor, dated August 19, 2013  
TS Action Statement Log Number 13-224, A SACS RMS/RACS RMS, dated August 26, 2013

### **Section 1R15: Operability Determinations and Functionality Assessments**

#### Procedures

ER-AA-1001, Component Classification, Revision 1  
HC.IC-FT.SM-0022, Logic System Functional Test NSSSS – Outboard Valve Control Logic,  
Revision 15

HC.OP-IS.GJ-0101(Q), 'A' Control and Diesel Area Temperature Control Valves Inservice Test, Revision 0  
HC.OP-IS.GJ-0102(Q), 'B' Control and Diesel Area Temperature Control Valves Inservice Test, Revision 0  
LS-HC-1000-1001, Hope Creek Generating Station Surveillance Frequency Control Program List of Surveillance Frequencies, Revision 3

Notifications (\*NRC identified)

20609494, Temp Control Valves Not IST Tested  
20609497, Temp Control Valves Not IST Tested  
20609498, Temp Control Valves Not IST Tested  
20609611, Temp Control Valves Not IST Tested  
20609612, Temp Control Valves Not IST Tested  
20609775, HCGS TS for IST vs OP-HC-108-115-1001  
20613232, Abnormal Indications – B EDG in MCR  
20613966, Abnormal Indications – B EDG  
20621408, 1BGTISH-N008-G33 Failed Surveillance  
20623534\*, Bailey Card Classifications  
20624412, 1BGTISH-N008-G33 Failed Surveillance

Drawings

M-44-1, Sheet 1, Reactor Water Clean-Up, Revision 35  
PN0-G33-4010-0011, Reactor Water Cleanup System High Pressure, Revision 18  
PN1-B21-1090-62, Sheet 16, Nuclear Steam Supply Shutoff System, Revision 24  
PN1-B21-1090-62, Sheet 17, Nuclear Steam Supply Shutoff System, Revision 16

Orders

50148610, ST 18M IC-FT.SM-022 ON NSSSS DIV-N CH-N  
70155551, Abnormal Indication B EDG Main Control Room  
70154357, Temperature Con Valves not IST Tested

Other Documents

Control Room Logs for June 24, 2013  
Functional location information for EDGs  
MR Scoping, EDGs  
OPEVAL 13-006, Temperature Control Valves not IST Tested, Revision 0  
OPEVAL 13-006, Temperature Control Valves not IST Tested, Revision 1

**Section 1R18: Plant Modifications**

Procedures

HC.OP-AB.RPV-0003(Q), Recirculation System/Power Oscillations, Revision 26

Notifications (\*NRC identified)

20608354, 'A' Recirc Pmp #2 Cavity Seal Hi Temp  
20609244, Entered AB-RPV-3 - Condition K20612197, Emergent Power Reduction 'A' Recirc Seal  
20612198, Power Reduced to Maintain Recirc Temps  
20612527, HC.OP-AB.RPV-0001 Cond B Entry

20612637, Entered HC.OP-AB.RPV-0001  
20613030, 'A' Recirc Seal Supplemental Cooler Trip  
20615525\*, NRC-Identified Wood in RCA

Drawings

M-43-1, Sheet 1 of 2, Reactor Recirculation System, Revision 33  
M-46-1, Sheet 1 of 2, Control Rod Drive Hydraulic – Part A, Revision 28

Other Documents

Adverse Condition Monitoring and Contingency Plan 13-008, Elevated 'A' Reactor Recirc Pump  
2<sup>nd</sup> Stage Seal Temperature, dated May 21, 2013  
Order 70154478-0030, Guidance for Restricting Reactor Recirculation Pump Speed Changes  
With a Degraded Mechanical Seal  
TCCP 4HT-13-008, Recirc Pump Seal Purge Temp Cooling, Revision 2  
TCCP 4HT-13-008/80109621, RRP 1AP201 Seal Purge Temporary Cooling, Revision 0

**Section 1R19: Post-Maintenance Testing**

Procedures

ER-HC-321-1011, Testing of Hope Creek ASME Class 1, 2, 2 Safety/Relief Valves, Revision 2  
HC.OP-DL.ZZ-0026(Q), Surveillance Log, T/S Surveillance and Planned Evolution AOT  
Tracking Log for June 3, 2013, Revision 136  
HC.OP-DL.ZZ-0026(Q), Surveillance Log, Revision 137  
HC.OP-IS.BC-0003(Q), BP202, 'B' RHR Pump In-Service Test, Revision 47  
HC.OP-SO.BC-0001(Q), RHR System Operation, Revision 53  
HC.OP-SO.GU-0001(Q), Filtration, Recirculation and Ventilation System Operation, Revision 25  
HC.OP-SO.KJ-0001(Q), EDGs Operation, Revision 65  
HC.OP-ST.BC-0005(Q), LPCI Subsystem B ECCS Time Response Functional Test – 18  
Months, Revision 16  
HC.OP-ST.GU-0001(Q), FRVS Operability Test (All Fans Method) - Monthly, Revision 39  
HC.OP-ST.GU-0005(Q), FRVS Operability Test (Single Recirculation Fan Method) - Monthly,  
Revision 4  
HC.OP-ST.KJ-0004(Q), EDG 1DG400 Operability Test - Monthly, Revision 65  
MA-AA-716-012, PMT, Revision 19  
OP-HC-108-115-1001, TS Action Statement Log for August 22, 2013  
PA-AA-3001, Position Paper on Preconditioning, Revision 0  
SH.IC-TI.ZZ-0001(Q), Electronic Soldering/Desoldering, Revision 5

Notifications (\*NRC identified)

20610447, Controller Failed High OOS  
20612285, 'A' RPV Narrow Range Level Indication  
20613407, B FRVS Fan Low Flow Trip  
20613436, B FRVS Recirc Fan Inoperability  
20613907, Need alternate indication for BB-LIR606A  
20614058, Missed Surveillance HC.OP-DL.ZZ-0026  
20615395, 'A' NR RPV Level Indicator  
20615477, 'A' RPV Narrow Range Level Indicator  
20615614, 'D' EDG Bezel PBS Indication Erratic  
20615923, 'D' EDG Isoch/Droop PB Indication Erratic  
20616042, 'A' RPV Narrow Range Level Indicator  
20616638, Replace LSR Relay for 'D' EDG

20618025, 'D' EDG Window Removed from WW 334 at E-1  
20618414, EQACE was Rejected at MRC  
20618638, EDG Outage and Recirc Fans  
20618639, 'D' EDG JW Keepwarm Temp Hi Alarm  
20618916, LSR Replacement WM & MA Gaps  
20618920, ST 10Y 1GSPSV-6292B Cat C Relief Valve Test  
20620228\*, EQACE 70155511 Questions Deficiencies  
20621002, MA-AA-734-002 Revision Request  
20621183\*, NRC pre-conditioning question  
20621343, 'B' RHR Room House Keeping

#### Orders

30205405, 10Y- 1KJSS-421D Replace Tachometer Relay  
30219029, 18M Cal 1B-VH213 Instruments  
50086351, ST 10Y 1GSPSV-6292B Cat C Relief Valve Test  
50160140, 1M ST HC.OP-ST.KJ-0004 D-EDG Test  
60096119, RP- 1KJSS-421D Per ECP 80102531  
60111709, 'A' RPV Narrow Range Level MCR Indicator  
60111956, 'A' RPV Narrow Range Level Indicator  
60112101, "D" EDG Isoch/Droop PB Indication Erratic  
70155511, B FRVS Recirc Fan Low Trip  
70156286, 'A' RPV Narrow Range Level Indicator  
80102531, Replacement of New EDG Speed Switch  
80103518, EDG O.6 Fault Exposure Evaluation  
80109716, Technical Evaluation of LI-R606A-C32

#### Other Documents

Control Room logs for June 2, 2013  
Control Room logs for June 3, 2013  
HC.OP-DL.ZZ-0026(Q), Surveillance Log T/S Surveillance and Planned Evolution AOT Tracking  
Log for June 3, 2013, Revision 136  
UFSAR, Section 6.8, Filtration, Recirculation, and Ventilation System, Revision 17

### **Section 1R22: Surveillance Testing**

#### Procedures

HC.OP-AB.ZZ-0001(Q), RCIC Injection, Revision 28  
HC.OP-IS.BD-0001(Q), RCIC Pump –OP203 – Inservice Test, Revision 58  
HC.OP-IS.GJ-0101(Q), 'A' Control and Diesel Area Temperature Control Valves Inservice Test,  
Revision 0  
HC.OP-IS.GJ-0101(Q), 'A' Control and Diesel Area Temperature Control Valves Inservice Test,  
Revision 1  
HC.OP-IS.GJ-0102(Q), 'B' Control and Diesel Area Temperature Control Valves Inservice Test,  
Revision 0  
HC.OP-IS.GJ-0102(Q), 'B' Control and Diesel Area Temperature Control Valves Inservice Test,  
Revision 1  
HC.OP-SO.BD-0001(Q), RCIC System Operation, Revision 43  
HC.OP-ST.KJ-0004(Q), EDG 1DG400 Operability Test – Monthly, Revision 76  
HU-AA-1211, Pre-Job Briefings, Revision 11  
WC-AA-101, On-line Work Management Process, Revision 21



Notifications (\*NRC identified)

20615614, 'D' EDG Bezel PBS Indication Erratic  
20615923, 'D' EDG Isoch/Droop PB Indication Erratic  
20617518, HC.OP-IS.GJ-0102(Q) Revision Request  
20617803, TV Does Not Close  
20617804, TV Did Not Open  
20618970, 1GJTV-9762B Did Not Open  
20619552, GJ-TV-9762A Didn't Stroke to Full B/P  
20621091\*, NRC Question Regarding RCIC IST Test  
20621527\*, NRC Question – Component Availability

Orders

50159892, ST 3M GJ 'A' VLV'S IST HC.OP-IS.GJ-0101  
50159893, ST 3M GJ 'B' VLV'S IST HC.OP-IS.GJ-0102  
60112449, 1GJTV-9762B DID NOT OPEN  
60112482, GJ-TV-9768B DOES NOT CLOSE  
60112586, GJ-TV-9762A DIDN'T STROKE TO FULL B/P  
70157034, HC.OP-IS.GJ-0102(Q) Revision Request

Other Documents

Action Statement Log Number 13-230, H1GJ-1GJ-TV-9762

**Section 1EP4: Emergency Action Level and Emergency Plan Changes**

Other Documents

Evacuation Time Estimate Study Update

**Section RS05: Radiation Monitoring Instrumentation**

Procedures

NC.RS-WC-0402(Q), Whole Body Counter Calibration, Revision 4  
RP-AA-220, Bioassay Program, Revision 7  
RP-AA-221, Whole Body Count Data Review, Revision 3  
RP-AA-222, Methods for Estimating Internal Exposure from In Vivo and In Vitro Bioassay data,  
Revision 5  
RP-AA-224, Evaluation of Bioassay Data, Revision 1

Other Documents

Whole Body Counter Calibration Data (March 2013)

**Section RS07: Radiological Environmental Monitoring Program**

Procedures

EN-AA-170-000, Radioactive Effluent and Environmental Monitoring Program, Revision 0  
EN-AA-170-1001, REMP Vendor Dosimetry and Laboratory QA Program, Revision 1

Other Documents

2011, 2012 Annual Radioactive Environmental and Effluent Release Reports Land Use Census

**Section 40A1: Performance Indicator Verification**

Procedures

ER-AA-2008, MSPI Failure Determination and Evaluation, Revision 0  
HC-MSPI-001, Hope Creek Generating Station Nuclear Regulatory Commission Regulatory Oversight Process MSPI Basis Document, Revision 7.  
LS-AA-2200, MSPI Data Acquisition & Reporting, Revision 4  
WC-AA-101, On-Line Work Management Process, Revision 21

Notifications (\*NRC identified)

20530070, NRC PI Change – MSPI EAC scope w/ FOTP  
20530071, NRC PI Change – MSPI EDG Failure definitions  
20530197, NRC PI Change – MSPI EDG Run Hour  
20530230, NRC PI Change – MSPI CW boundary  
20530950, MR SSW Loop Unavailable Correction  
20589775, Barring Evolutions in Narrative Logs  
20602350, HPCI Aux Oil Pump Failed To Start

Orders

70152218, HPCI Aux Oil Pump Failed To Start

Other Documents

10855-D3.38, Design, Installation and Test Specification for HPCI System for the Hope Creek Generating Station, Revision 9

**Section 40A2: Problem Identification and Resolution**

Miscellaneous

2011, 2012 Annual Radioactive Effluent Release and Environmental Monitoring Reports  
Corrective Action Documents (Notifications) - various

**Section 40A3: Follow-up of Events and Notices of Enforcement Discretion**

Procedures

AD-AA-2001, Management and Oversight of Supplemental Workforce, Revision 7  
FP-AA-008, Fire Prevention for Hot Work, Revision 5  
LS-AA-120, Issue Identification and Screening Process, Revision 11  
MA-AA-1000, Conduct of Maintenance Manual, Revision 14  
MA-AA-1002, Work Management Responsibilities for Maintenance, Revision 0  
TQ-AA-137, Supplemental Personnel Training Process, Revision 4

Notifications (\*NRC identified)

20611742, Crack in Weld, resulting in approximately 1GPM leak  
20614723, Crack in Weld, resulting in approximately 1GPM leak  
20616707, RHR Vent Valve Follow Up

Drawings

M-51-1, Sheet 1, RHR, Revision 43  
M-51-1, Sheet 2, RHR, Revision 40

Orders

30087016, 18M H1BB 'B' Loop Recirc Pipe Elbow Taps

60111317, Crack in Weld Resulting in Approximately 1GPM leak

70152218, HPCI Aux Oil Pump Failed to Start

Other Documents

DEH130143, Final Report: Laboratory Analysis of a Socket Welded Connection from the RHR System at Hope Creek, August 2013

**LIST OF ACRONYMS**

AC	alternating current
ACE	Apparent Cause Evaluation
ADAMS	Agencywide Documents Access and Management System
CAP	corrective action program
CFR	Code of Federal Regulations
CS	core spray
CWP	circulating water pump
EDG	emergency diesel generator
FRVS	filtration, recirculation, and ventilation system
HCGS	Hope Creek Generating Station
HPCI	high pressure coolant injection
HX	heat exchanger
IMC	Inspection Manual Chapter
LER	licensee event report
LOCA	loss of coolant accident
MR	Maintenance Rule
MSPI	Mitigating System Performance Indicator
NCV	non-cited violation
NDE	non-destructive examination
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OD	operability determination
ODCM	offsite dose calculation manual
PARS	publicly available records
PD	performance deficiency
PI	performance indicator
PMT	post-maintenance testing
PSEG	Public Service Enterprise Group Nuclear LLC
RB	reactor building
RCIC	reactor core isolation cooling
RCS	reactor coolant system
REMP	radiological environmental monitoring program
RHR	residual heat removal
PMT	post-maintenance test
RRP	reactor recirculation pump
SACS	safety auxiliaries cooling system
SDC	shutdown cooling
SDP	significance determination process
SSC	structure, system, or component
TS	technical specification
UFSAR	Updated Final Safety Analysis Report
WO	work order